

NISTTech

Etchant/Primer Composition, Etchant/Primer/Adhesive Monomer Composition, Kits & Methods using the Same for Improved Bonding to Dental Substrates

Stronger teeth through remineralization

Description

This remineralization method involves the use of amorphous calcium phosphate compounds in a carbonate solution that crystallizes to form hydroxyapatite, the primary mineral in teeth and bone. The process disperses hydroxyapatite into the tooth structure to "fill" the microscopic holes and repair early cavities, actually making teeth stronger.

These composites, made of amorphous calcium phosphate embedded in polymers, efficiently promote re-growth of tooth structures. In the presence of saliva-like solutions the material releases calcium and phosphate ions, forming a crystalline calcium phosphate similar to the mineral found naturally in teeth and bone.

Applications

- **Dental**
Anti-cavity liners for conventional fillings
- **Orthodontics**
Adhesive cements for braces

Advantages

- **Stable, fast reaction time**
Improves the remineralization process and provides rapid action

Abstract

The present invention is directed to an etchant/primer composition, an etchant/primer/adhesive monomer composition, kits using the same and methods using the same for improved bonding to dental structures. The etchant/primer composition comprises a compound having the formula: $RN(CH_2 YCO_2 M)_2$ wherein $R=R_1$ or R_2 ; R_1 =an aromatic group; R_2 =a conjugated unsaturated aliphatic group; Y =a single bond, CH_2 , $CHCH_3$ or $C.dbd.CH_2$; and each M is independently H , an alkali metal, an alkaline earth metal, aluminum, a transition or redox metal or an alkyl group having 1 to 18 carbon atoms, with the proviso that when both M groups are alkyl groups, said compound is capable of being easily hydrolyzed,

displaced, or exchanged with other reagents present in the etchant/primer composition, a polar solvent system, and nitric acid. The etchant/primer/adhesive monomer composition comprises a compound having the formula (I) as noted above, a polar solvent system, an acid selected from the group consisting of nitric acid, hydrochloric acid, citric acid, lactic acid, glycolic acid, formic acid, pyruvic acid and combinations thereof, and adhesive monomer resin, and an initiator. The above-noted compositions are applied to dental structures requiring dental restoration for improved bonding of adhesive resins and polymers to dental structures.

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Related Items

- Article: Tooth, Heal Thyself

References

- U.S. Patent # 6,458,869
- Docket: 98-005US

Status of Availability

This invention is available for exclusive or non-exclusive commercialization licensing. Collaborative research opportunities are available.

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